

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:	BRÖCKER ET AL	DOCKET No.:	50487
SERIAL No.:	09/629,482	CONFIRMATION No.:	4024
FILING DATE:	07/31/2000	EXAMINER:	DANG, THUAN D.
CUSTOMER No.:	26474	ART UNIT:	1764

FOR: ISOTHERMAL OPERATION OF HETEROGENEOUSLY CATALYZED THREE PHASE REACTIONS

Honorable Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Reply Brief under 37 C.F.R. § 41.41

Sir:

This is a Reply Brief to the Examiner's Answer mailed May 31, 2007. Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account 14.1437. Please credit any excess fees to such account.

Respectfully submitted,  
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REMARKS**Rejections under 35 U.S.C. §112, second paragraph:**

In the Examiner's Answer mailed May 31, 2007, the examiner states that "[i]t is unclear the expression [*sic*] 'without ... fluid' is applied to the passing step or the flow in the reactor."

In response, appellants would like to re-emphasize the arguments presented in the Appeal Brief filed February 23, 2007, to the effect that the phrase "passing the generated reaction fluid, without substantial change in the degree of the dispersion of said reaction fluid, through a reactor"<sup>1</sup> has a clear and precise meaning that is readily discernible to one of ordinary skill in the art, especially when read in light of the present specification. Moreover, appellants have clearly asserted that the claim requires there to be substantially no change in the degree of dispersion both in the feed line and through the reactor. Accordingly, Appellants assert that instant claims 11 – 16, are definite and respectfully request reversal of the instant rejection under 35 U.S.C. §112.

**Rejections under 35 U.S.C. §103:**

Claims 11 – 16 stand rejected under 35 U.S.C. §103(a) over Arganbright et al. (USPN 4,950,834), however, the Examiner has not set forth a *prima facie* case of obviousness with regard to the invention of claim 11 as a whole, because claim 11 requires at least the following:

I. A process for carrying out a reaction under isothermal conditions

Arganbright et al. do not teach a process for carrying out a reaction under isothermal conditions. To the contrary, Arganbright et al. teach that

the temperature along the column will be as in any distillation column, the highest temperature will be in the bottom and the temperature along the column will be the

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<sup>1</sup> Claim 11.

boiling point of the composition at that point in the column under the particular conditions of pressure.<sup>2</sup>

Since, Arganbright et al. do not teach a process for carrying out a reaction under isothermal conditions, and the examiner has provided no apparent reason to modify the reference in this regard, the present rejection is in error and should be reversed.

II. Generating a Reaction Fluid and Passing the Generated Reaction Fluid through a Reactor

Claim 11 requires the step of “generating a reaction fluid by dispersing the gas phase containing the at least one gaseous reactant in the liquid phase, containing the at least one liquid reactant and producing a reaction thereby.” The claim as a whole makes clear that this generation step is not performed inside the reactor, because the generated reaction fluid is subsequently passed through a reactor. As argued in the Appeal Brief filed February 23, 2007, Arganbright et al. not only fails to teach or suggest this claim limitation. The examiner has failed to point to any teaching, suggestion or motivation for a person of ordinary skill in the art to modify the reference to arrive at a process which includes the step of generating a reaction fluid and subsequently passing the generated reaction fluid through a reactor.

III. Passing the Generated Reaction Fluid through a Reactor without substantial change in the degree of dispersion of the reaction fluid

Claim 11 requires the step of “passing the generated reaction fluid, without substantial change in the degree of the dispersion of said reaction fluid, through a reactor.”<sup>3</sup> The Arganbright et al. reference provides no apparent reason to avoid substantial change in the degree of dispersion of a reaction fluid as it passes through a reactor. The examiner has not attempted to point to such an apparent reason, but instead merely states that the claimed reactor “is indistinguishable from the one used in the

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<sup>2</sup> Column 8, indicated lines 34 – 39 of US 4,950,834.

<sup>3</sup> Claim 11.

Arganbright process.”<sup>4</sup>

On the one hand, the examiner argues that propylene “must be dispersed” into any down-flowing benzene stream, and that therefore some sort of pseudo-reaction fluid is generated in the Arganbright et al. reactor. On the other hand, the examiner argues that this pseudo-reaction fluid passes through the reactor without substantial change in the degree of the dispersion. Unless the examiner also takes the position that the pseudo-reaction fluid is generated instantaneously, both arguments cannot be true. Assuming for the sake of argument that propylene is dispersed into a down-flowing benzene stream, a skilled artisan would not expect such dispersion to occur instantaneously, but would expect the propylene to be dispersed gradually, if at all. If the dispersion occurs gradually, it is clear that the degree of dispersion changes through the reactor, and that the Arganbright et al. reference does not teach “passing the generated reaction fluid, without substantial change in the degree of the dispersion of said reaction fluid, through a reactor.”

#### IV. Reactor Space Equipped with Woven or Knitted Metal Fabrics Coated with Catalyst

Arganbright et al.’s disclosure of enclosing catalytic particles in a container such as a cloth, screen wire or polymeric mesh in no way teaches or suggests the utilization of a woven or knitted metal fabric coated with a catalyst. The examiner’s assertion that “[c]learly sieves must be on the knitted wire (coated),”<sup>5</sup> is precisely the opposite of what Arganbright et al. disclosed, i.e. that catalytic particles are enclosed in a container such as a cloth, screen wire or polymeric mesh.

In the Examiner’s Answer mailed May 31, 2007, the examiner states that the reference “discloses ... how the catalyst is loaded in the reactor[,]”<sup>6</sup> and then somehow concludes that “it is clear that the Arganbright reactor is equipped with metal meshes coated with catalysts.” To the contrary, it should be clear that the molecular sieves, “three-dimensional alumina-silicates of the zeolite mineral group,”<sup>7</sup> of Arganbright et al.,

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<sup>4</sup> Page 6, lines 20 – 21 of the Examiner’s Answer.

<sup>5</sup> Page 3, lines 1 – 3 of the Advisory Action dated October 27, 2006 (emphasis added).

<sup>6</sup> Page 7, lines 2 – 4 of the Examiner’s Answer.

<sup>7</sup> Column 3, indicated lines 65 – 66 of US 4,950,834.

in no way obviate a coating of a woven or knitted metal fabric.

#### V. Transferring Heat

Claim 11 requires the step of “transferring the heat through the reactor to a cooling fluid medium on the reaction wall surface facing away the reactor space.”<sup>8</sup> As discussed in the Appeal Brief, filed February 23, 2007, the examiner’s contention that an air conditioned room would be sufficient to control reactor temperature is wholly contrary to the teachings of Arganbright et al., who teach controlling temperature by modifying pressure. Moreover, the Examiner’s contention that an air conditioned room would be sufficient to control reactor temperature is tenuous at best, wholly speculative and completely unreasonable absent objective evidence illustrating the same.

#### VI. Separating the Reaction Fluid into Gas and Liquid phases

Claim 11 requires the step of “separating the reaction fluid into gas phase and liquid-phase.” As discussed in the Appeal Brief, filed February 23, 2007, in the Arganbright et al. process “the initial reaction product is removed from the reaction zone as quickly as it is formed,”<sup>9</sup> flowing to the bottom of the distillation column and exiting via line 8, and

[t]he feed of propylene is adjusted such that there is a molar excess of benzene in the reactor, such that the overhead 5 is primarily benzene, the propylene having been almost totally reacted. In addition to benzene and some propylene other lights go off overhead. The overhead is passed to condenser 13 which is operated to condense substantially all of the benzene ....<sup>10</sup>

Thus, contrary to the examiner’s statement that the claimed step “must be recognized when on[e] having ordinary skill in the art see [*sic*] figure 1 in which unreacted materials as a gas go out [*sic*] the reactor via stream 5 and cumene as a liquid flow down stream

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<sup>8</sup> Claim 11.

<sup>9</sup> Column 3, lines 24 – 25 of Arganbright et al. (US 4,950,834).

<sup>10</sup> Column 7, lines 37 – 44 of Arganbright et al. (US 4,950,834) (emphasis in original).

8[,]”<sup>11</sup> Arganbright et al. never disclose “separating [a] reaction fluid into gas phase and liquid-phase.”<sup>12</sup>

In Conclusion:

The examiner has failed to establish a *prima facie* case of obviousness. For at least these reasons, the rejection of claim 11 is in error and should be reversed. “If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.”<sup>13</sup> Thus, claims 12 – 16 are also nonobvious.

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<sup>11</sup> Page 7, lines 16 – 18 of the Examiner’s Answer.

<sup>12</sup> Claim 11.

<sup>13</sup> MPEP §2143.03, citing *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).